AMENDMENTS TO THE SPECIFICATION

Please replace the Title of the Invention with the following new title:

-- PROBE TIP AND METHOD OF MANUFACTURING PROBE TIPS BY PEEL-OFF --.

Please replace paragraph [0004] with the following amended paragraph:

[0001] Metal is preferably used as tip material due to its excellent electrical conductivity. Silicon (Si) tips with a thin metal coating, typically 10-25 nm thick, are commercially available since the early 1990's but the metal coatings rapidly wear off. Therefore solid metal pyramids made by the so-called ~~moulding~~ molding technique have been developed which are integrated into Si cantilevers or metal cantilevers. The metal cantilever probes, also called full metal probes, are preferred because they are highly conductive and require fewer process steps. In European Patent No 0899538 "A probe tip configuration, a method of fabricating probe tips and use thereof", (which is hereby incorporated by reference in its entirety) the inventors discloses a method of fabricating probe tips applying said so-called ~~moulding~~ molding technique. The fabrication and use of a metal tip is disclosed in "Fabrication and use of metal tip and tip-on-tip probes for AFM-based device analyses", by T. Hantschel et al. Proc. of SPIE, 3512, pp. 92-103, 1998 (which is hereby incorporated by reference in its entirety). A method of manufacturing full metal probes is disclosed in "Fabrication of an all-metal atomic force microscope probe", J.P. Rasmussen, Proc. Of Transducers '97, p 463-466, 1997 or in "The fabrication of a full metal AFM probe and its applications for Si and InP device analysis", T. Hantschel et Al., Proc. Micromachining and Microfabrication conference, 1999 (both hereby incorporated by reference in their entirety). This manufacturing method is schematically illustrated in figure 1e-1f. In figures 1e and 1f the cantilever is drawn in side view for the purpose of teaching.

Please replace paragraph [0006] with the following amended paragraph:

[0002] In European Patent No. 0763844 entitled "method of manufacturing micro-tip and female ~~mould~~ mold substrate therefor, and method of manufacturing probe with micro-tip" (which is hereby incorporated by reference in its entirety) some of these disadvantages are indicated. The inventor T. Yagi proposes a method to overcome some of the above-mentioned

disadvantages, as illustrated in figure 2. According to European Patent No. 0763844 the first substrate is used to define the probe tip (23) while the second substrate is used to define the cantilever. Depending on the choice of the second substrate or its stack composition several types of cantilevers can be obtained. The first substrate could be re-used.

Please replace paragraph [0011] with the following amended paragraph:

[0003] One object of the invention is to a method comprising the steps of providing a substrate, depositing on said substrate a hard mask. During a first patterning step a ~~mould~~ mold is created in said hard mask and said substrate. A first layer is deposited on said patterned hard mask. This first layer has a sufficiently high enough adhesion to said hard mask to allow further processing, but this adhesion force is weak enough to be overcome when peeling the probe gradually from said underlying hard mask. During a second patterning step said first layer is patterned to form a probe tip configuration comprising at least a probe tip. By partially or fully under-etching said probe tip configuration from the front side of the substrate, the probe tip configuration can be removed from said substrate by lifting the probe.

Please replace paragraph [0018] with the following amended paragraph:

[0018] ~~Figures 1 represents~~ Figures 1a-f represent a prior art method of manufacturing a full metal probe comprising a tip, cantilever and membrane applying the ~~moulding~~ molding technique, illustrated by cross sectional views.

Please replace paragraph [0019] with the following amended paragraph:

[0019] ~~Figure 2 represents~~ Figures 2a-e represent a prior art method of manufacturing a tip to avoid backside etching of the ~~moulding~~ molding substrate illustrated by cross sectional views.

Please replace paragraph [0020] with the following amended paragraph:

[0004] ~~Figure 3 represents~~ Figures 3a-e represent a process scheme for peel-off probes made by two lithography steps, upper part is top view, and bottom part is a cross sectional view along section AA.

Please replace paragraph [0021] with the following amended paragraph:

[0005] ~~Figure 4 represents~~ Figures 4a-e represent a probe with 4 cantilevers illustrating the peel-off process illustrating the options of fully or partially under-etching the probe

Please replace paragraph [0022] with the following amended paragraph:

[0006] ~~Figure 5 represents~~ Figures 5a-f represent a probe removal by peel-off according to an embodiment of the invention

Please replace paragraph [0023] with the following amended paragraph:

[0007] ~~Figure 6 represents~~ Figures 6a-c represent a SEM picture of full metal peel off probe according to the preferred embodiment

Please replace paragraph [0024] with the following amended paragraph:

[0008] ~~Figure 7 represents~~ Figures 7a-b represent a topography measurements done on a SrTiO3 calibration sample in tapping mode. Left side shows the AFM picture. Right side shows the measured height h measured along the cross section x.

Please replace paragraph [0025] with the following amended paragraph:

[0009] ~~Figure 8 represents~~ Figures 8a-e represent a process scheme for peel-off probes with different metallisation scheme for probe tip and cantilever, upper part is top view, and bottom part is a cross sectional view along section AA

Please replace paragraph [0026] with the following amended paragraph:

[0010] ~~Figure 9 represents~~ Figures 9a-d represent a metal cantilever with hardened tip made by peel off according to one embodiment of the invention.

Please replace paragraph [0027] with the following amended paragraph:

[0011] ~~Figure 10 represents~~ Figures 10a-b represent I-V measurements in point contact mode using an unhardened Ni tip (a) or a hardened Ni tip (b) according to an embodiment of the invention

Please replace paragraph [0032] with the following amended paragraph:

[0012] This method comprises the following steps. During the first patterning step a ~~mould~~ mold (34a) is formed in the starting substrate (31), preferably a silicon wafer. (fig. 3a) This ~~mould~~ mold may have one of various shapes, e.g., pyramidal, a truncated cone, a cylinder. In case a silicon wafer is used a truncated pyramidal etch pit is formed by anisotropically etching the substrate trough an opening defined in a masking layer formed on top of the substrate. Such a masking layer can be a photo resist or a hard mask (32), e.g. nitride, oxide, oxynitride or a combination of layers. This step of defining the probe tip configuration comprises the first front side lithographic step.

Please replace paragraph [0033] with the following amended paragraph:

[0013] On top of the first surface, i.e. the top surface of the substrate, or the hard mask if used, in which the ~~mould~~ mold is defined, a first layer (33), preferably metal, is deposited. (fig. 3b)

Please replace paragraph [0042] with the following amended paragraph:

[0014] Figure 4 illustrates the under-etching of the cantilevers during the anistropic KOH etching. As can be seen, in this particular design one probe has four cantilevers (41), respectively 200, 400, 600 and 800 μm long. The cantilevers are 65 μm wide and 12 μm thick. The pictures were taken under an optical microscope. Figure 4a shows the probe before etching with the Si_3N_4 layer (32) still in place (Fig. 4a). Figures 4b illustrates the case of under-etching the cantilevers (41), the tips (34) and the bridges (42) (Fig. 4b). Figure 4c shows the probe after the probe membrane was peeled off (Fig. 4c). The yield after under-etching was nearly 100%, which was also confirmed by several process runs. An advantage of the developed procedure is that the probe membranes are not free standing as the full wafer, contrary to conventional probe

~~moulding~~ molding, supports them. Therefore the probes survive mechanical shocks during and after processing without any problem. The total under-etching time depends on the longest or largest cantilever.